calendar

APRIL 1973

- OHIO SECTION OF APS Springfield, Ohio 1/73
- ☐ SPS (ZONE 3) ☐ Greenville, Pa. 2/73
- 9-11 Thin Films | IOP | Lancaster, UK 8/72
- Vacuum Science ☐ NEW MEX-ICO CHAPTER OF AVS ☐ Albu-9-11 querque, N.M. 9/72
- 9-13 Solid Compounds of Transition Elements ORGANIZING COMMITTEE OF 4TH INTERNA-CONFERENCE ON TIONAL SOLID COMPOUNDS OF TRAN-SITION ELEMENTS D Geneva. Switzerland 2/72
- 9-14 Plasma Physics, Fast Processes and Quantum Optics

 GERMAN PHYSICAL SOCIETY | Berlin, Germany 2/73
- 10-13 □ ASA □ Boston, Mass. (B. H. Goodfriend, 335 E. 45th St, New York, N. Y. 10017)
- Atomic and Molecular Physics ATOMIC AND MOLECULAR PHYSICS SUBCOMMITTEE OF IOP D Newcastle-upon-Tyne, UK 7/72
- 11-13 Optical Instrumentation in Highway and Traffic Engineering SOCIETY OF PHOTO-OPTICAL INSTRUMENTATION ENGI-NEERS, US DEPT. OF TRANS-PORTATION, FEDERAL HIGH-

ADMINISTRATION Washington, D.C. 9/72

- 13, 14 D APS NEW ENGLAND SEC-TION | Hartford, Conn. (P. Solomon, United Aircraft Laboratories, East Hartford, Conn.)
- ☐ SPS (ZONE 3) ☐ Lancaster, 13.14 Pa. 2/73
- 13.14 Irreversibility, Time Reversal and the Expanding Universe

 NEW YORK SECTION OF APS Cortland, N. Y. 1/73
- 16, 17 Contributions of Basic Heat Transmission Measurement to the Design and Behavior of Thermal Insulation Systems □ ASTM ON THERMAL COMMITTEE AND CRYOGENIC INSULATING MATERIALS D Philadelphia, Pa. 12/72
- 16, 17 Polymer Burning-Forest Fires □ WESTERN STATES SECTION OF COMBUSTION ARIZ. STATE UNIV. | Tempe, Ariz. (R. P. Wilson, Ultrasystems, Inc. 2400 Michelson Dr. Irvine, Calit. 92664)
- 16-18 Electron Density and Related Topics ☐ IOP ☐ University College, Cardiff, UK (Meetings Officer, 47 Belgrave Square, London SW1X 8QX, UK)
- The Liquid State: Van Der Waals Centenary D SOLID STATE SUBCOMMITTEE OF IOP, UNIV. OF KENT

 Canterbury, UK

This is a complete calendar of physics-related meetings. For the next two months we will publish only new information (partial calendars); in the third month (July) we will again publish a complete calendar.

ONR

ORNL

Abbreviations:

American Association of Physics Teachers AAPT American Astronomical Society American Crystallographic Association American Physical Society AAS ACA APS ASA OSA Acoustical Society of America Optical Society of America Society of Physics Students SofR Society of Rheology

AAPM American Association of Physicists in Medicine AEC US Atomic Energy Commission

American Institute of Aeronautics and AIAA Astronautics

American Nuclear Society ANS ASTM American Society for Testing and Ma-AVS American Vacuum Society European Physical Society International Atomic Energy Agency Institute of Electrical and Electronics EPS IAEA IEEE Engineers The Institute of Physics International Union of Pure and Applied IOP **IUPAP** Physics NAS National Academy of Sciences National Bureau of Standards National Science Foundation Office of Naval Research NBS NSF

Oak Ridge National Laboratory

Coding:

date subject | HOST | Location (Contact) [submission deadline] Physics Today ref. new listing • new information

RUGGED DT 500 Silicon, Diode **CRYOGENIC** SENSOR 1 TO 400K



Extreme Sensitivity: below 30K, up to 50 mV/K; above 30K, 2.7 mV/K Interchangeability: Sensors available matched to .1K or better @ 4.2 and within 1K between 40 and 400K

Multiple Configurations: for every application

For further information write or call:



LAKE SHORE CRYOTRONICS, INC. Announces

CRYOGENIC TEMPERATURE

.001K 1 to 25K .01K 25 to 400K



with direct temperature readout from the control sensor and test specimen sensor.

Sensitivity: .001K from 1 to 25K, .01K from 25 to 400K

Control Range: 1 to 400K

Temp. Readout Accuracy: 0.1K or better

Sensors: TG-100 GaAs Diodes or DT-500

Silicon Diodes

Heater Input: 10-3 to 10 watts Current Ranges: 10 mA, 100 mA, and 1 A f.s. Remote set point control capability



9631 SANDROCK RD. Circle No. 64 on Reader Service Card



ISO PROBE Measures

ELECTROSTATIC # POTENTIAL

Without Physical Contact

The Easy Way For Research or Production Line

APPLICATIONS

Accurate surface potential measurement of small area Measurement of Electrets Illumination effects on charged surface Surface charge leakage measurement Electrostatic field measurement Electrostatic monitoring systems for:

Hazardous industrial areas Hospitals Film Processors Flammable fuel storage and transfer areas Aircraft Plastic Manufacturing **Textile Manufacturing**

FEATURES

- Simple Operation No Time Consuming Set-ups or Special Shielding Required Drift Free Performance
- Absolute Calibration
- Accuracy Essentially Independent of Probe-to-Surface Spacing
- Inherent error less than 0.1%
- Millivolt to kilovolt ranges
- Surface resolution better than 0.03" circle
- **New TRANSPARENT PROBE** Uses no mirrors or Coated Glass - Permits Direct Illumination of Charged Areas

ALSO AVAILABLE:

Portable Instruments D.C. Fieldmeters Special Purpose Electrometers

Write today for catalog



MONROE ELECTRONICS, INC

100 HOUSEL AVENUE LYNDONVILLE, NEW YORK 14098

APRIL 1973

- 16-19 Ion-Molecule Reactions DEUTSCHE BUNSENGESELL-SCHAFT D Berlin, Germany 2/73
- 17, 18 Laser-Produced Plasmas □ IOP ☐ Univ. of Hull, UK (Meetings Officer, 47 Belgrave Square, London SW1X 8QX, UK)
- Baryon Resonances ☐ PURDUE 20, 21 UNIV. PHYSICS DEPT. D Purdue Univ. 3/73
- Solid State: Recent Advances in 21-26 Science and Technology of Materials | NSF, THE AMERICAN UNIV. IN CAIRO, EIN SHAMS UNIV. Cairo, Egypt 2/73
- 23-26 ☐ APS ☐ Washington, D. C. 12/72
- Scanning Electron Microscopy 23-27 ☐ IIT RESEARCH INST. ☐ Chicago, III. 3/73
- 24-27 MAGNETICS Magnetism SOCIETY OF IEEE, ONR Washington, D. C. 12/72
- 25-27 Nondestructive Evaluation SOUTH TEXAS SECTION OF FOR AMERICAN SOCIETY NON-DESTRUCTIVE TESTING, SOUTHWEST RESEARCH IN-STITUTE

 San Antonio, Tex. 12/72
- Holography in Biomedical Sciences □ DEPT. OF OPHTHAL-26-28 MOLOGY, NEW YORK MED-ICAL COLLEGE | New York, N. Y. 3/73
- ☐ MISSOURI SECTION OF 27, 28 AAPT Univ. of Mo. at Columbia 2/73
- □ IOWA SECTION OF AAPT □ 28 Grinnell, Iowa 2/73
- 30, 1 Electro-Optics □ SOCIETY OF PHOTO-OPTICAL INSTRUMEN-TATION ENGINEERS, OSA Boston, Mass. 2/73
- 30-2 Instrumentation in Vacuum Processes D VACUUM GROUP OF IOP London, UK 10/72

MAY 1973

- 1, 2 Electron Device Techniques ADVISORY GROUP ON ELEC-TRON DEVICES, IEEE ELEC-TRON DEVICES GROUP IN New York, N. Y. 11/72
- Display Materials and Devices 3 □ NEW YORK CHAPTER OF AVS Murray Hill, N. J. (W. E. Loeb, Union Carbide Corp. Chemicals and Plastics Division, River Rd, Bound Brook. N. J. 08805)
- 4-7 Electrostatic Accelerators

- SCIENCE RESEARCH COUNCIL □ Daresbury, UK 8/72
- 8-12 Instrumentation for High-Energy Physics | IUPAP, COMITATO NAZIONALE PER L'ENERGIA NUCLEARE, ISTITUTO NAZIO-NALE DI FISICA NUCLEARE D Frascati, Italy 3/73
- 12 SPS REGIONAL MEETING □ Los Angeles, Calif. 3/73
- Silicon Materials Science and 13-18 Technology

 ELECTRONICS AND ELECTROTHERMICS AND METALLURGY DIVISION OF THE ELECTROCHEMICAL SOCI-ETY Chicago, III. 7/72
- Environmental Behavior of Ra-14-18 dionuclides Released in the Nuclear Industry □ IAEA, NU-CLEAR ENERGY AGENCY OF THE ORGANIZATION FOR ECO-NOMIC COOPERATION AND DEVELOPMENT, WORLD HEALTH ORGANIZATION D Aix-en-Provence, France 2/73
- 15-17 Astronomical Observations with Television-Type Sensors UNIV. OF BRITISH COLUMBIA □ Vancouver, Canada (G. A. H. Walker, Inst. of Astronomy and Space Science, Univ. of British Columbia, Vancouver 8, B. C., Canada)
- Mass Spectrometry

 AMERI-20-25 SOCIETY FOR MASS CAN SPECTROMETRY - San Francisco, Calif. 2/73
- 21-23 Electron-, Ion- and Laser-Beam Technology D ELECTRON DE-VICES GROUP OF IEEE, AVS I 2/73
- 23-25 Phase Transitions and Applications ONR, MATERIALS RE-SEARCH SOCIETY | University Park, Pa. 12/72
- Doppler-Free Methods of Spec-23 - 27troscopy on Excited Levels of Simple Molecular Systems

 CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE Aussois, France 3/73
- 24, 25 Surface Physics Symposium WASHINGTON STATE UNIV. □ Pullman, Wash. (E. E. Donaldson, Physics Dept., Washington State Univ., Pullman, Wash. 99163)
- Molecular Spectroscopy ☐ USSR 28 - 1SCIENCES, ACADEMY OF ACADEMY OF SCIENCES OF THE ESTONIAN SSR
 Tallinn. USSR 2/73
- Neutron Physics ☐ USSR ACAD-28 - 3EMY OF SCIENCES | Kiev. USSR 2/73
- Laser Engineering and Applica-30 - 1tions | IEEE QUANTUM ELEC-

PHYSICS TODAY / APRIL 1973

TRONICS COUNCIL, OSA D Washington, D. C. 3/73

30-1 The Use of Low-Energy Accelerators □ POLYTECHNIC OF THE SOUTH BANK, IOP □ London, UK 11/72

JUNE 1973

- 4-8 Conference on Carbon ☐ THE AMERICAN CARBON COMMITTEE, ORNL ☐ Gatlinburg, Tenn. 3/73
- 4-8 Vacuum Metallurgy

 SOCIETY OF JAPAN; THE IRON AND STEEL INST. OF JAPAN; THE JAPAN INST. OF METALS; AVS; INTERNATIONAL UNION FOR VACUUM SCIENCE, TECHNIQUE AND APPLICATIONS
 Tokyo, Japan 2/73
- 5,6 Nuclear Magnetic Resonance in Nonmetals
 BRITISH RADIO SPECTROSCOPY GROUP
 Brighton, UK 12/72
- 10-15 ANS ANNUAL MEETING Chicago, III. 2/73
- 11–15 High-Energy Multiparticle Production Processes ☐ GORDON RESEARCH CONFERENCES ☐ Plymouth, N. H. 3/73
- 11-15 Molecular Structure and Spectroscopy □ OHIO STATE UNIV.
 □ Columbus, Ohio 2/73
- 2-16 Low-Energy Ion Accelerators and Mass Separators □ CHALMERS UNIV. OF TECH. □ Skovde, Sweden 2/73
- 13–15 Calorimetry ☐ THE CALORIM-ETRY CONFERENCE ☐ Worcester, Mass. 3/73
- 17-20 Strontium-Containing Compounds □ NOVA SCOTIA TECH-NICAL COLLEGE □ Nova Scotia, Canada 11/72
- 17-21 ☐ HEALTH PHYSICS SOCIETY ☐ Miami Beach, Fla. 11/72
- 17-22 ☐ ACA ☐ University of Connecticut, Storrs, Conn. 1/73
- 18-20 APS East Lansing, Mich. 2/73
- 18-22 Atomic Physics ☐ GORDON RESEARCH CONFERENCES ☐ Andover, N. H. 2/73
- 18-22 High Energy Physics and Nuclear Structure □ IUPAP □ Uppsala, Sweden 1/73
- 20-22 Symmetry in Nature ☐ AMERI-CAN ASSN. FOR THE AD-VANCEMENT OF SCIENCE ☐ Mexico City, Mexico 2/73
- 24-29 Critical Evaluation of Chemical and Physical Structural Information ☐ COMMITTEE ON CHEMI-



AC/DC Digital Multimeter has all the sensitivity, ranges and functions you need ... built in.

The new Keithley Model 171 Microvolt Digital Multimeter provides you with more measuring ranges than any other multimeter in its class. At only \$895 the 4½ digit Model 171 is the only multimeter you need whether it be for bench, systems, or servicing use — or all three.

This DMM eliminates the need for add-on preamps, plug-in circuit boards, hand-on shunts or other run-arounds. The only option we need offer is an easy-to-interface BCD output — and that's available built in.

The Model 171 measures

- · dc voltage from 1 microvolt to 1000 volts
- · ac voltage from 10 microvolts to 1000 volts
- ac & dc current from 100 picoamperes to 2 amps
- resistance from 100 milliohms to 2000 megohms

With all its capability this new Multimeter is really "sweet to have" . . . and our newest "how sweet" button proclaims just that. Get yours — and complete data or a demonstration of the Model 171 — today.



Joint Winter Meeting and Exhibit

American Physical Society
American Association of Physics Teachers
Palmer House, Chicago
February 4-6, 1974

AND . . . FOR THE FIRST TIME

Joint Spring Meeting and Show

Stressing optics and its applications to other branches of physics

American Physical Society
Optical Society of America
Sheraton-Park Hotel, Washington, D. C.
April 22-24, 1974

For exhibit information please write

Edward P. Greeley

AMERICAN INSTITUTE OF PHYSICS

335 East 45th Street

New York, N. Y. 10017

NEW LISTING OF SHORT COURSES AND SCHOOLS

17-30 JUNE

CERN-JINR School of Physics □ EUROPEAN CENTER FOR NUCLEAR RESEARCH, JOINT INST. FOR NU-CLEAR RESEARCH □ Ebeltoft, Denmark (CERN Scientific Conference Secretariat, 1211 Geneva, 23 Switzerland)

2-27 JULY

Environmental Aspects of the Radiation Sciences
OAK RIDGE ASSOCIATED UNIVERSITIES
Oak Ridge, Tenn. (L. K. Akers, Special Training Division, Oak Ridge Associated Universities, P. O. Box 117, Oak Ridge, Tenn. 37830) [4/16/73]

6-26 JULY

Subnuclear Physics—Laws of Hadronic Matter | INTERNATIONAL SCHOOL OF SUBNUCLEAR PHYSICS | Erice, Sicily (A. Zichichi, Univ. of Bologna, Via Irnerio 46, L-40126 Bologna, Italy)

9-20 JULY

Physics of Quantum Electronics ☐ OPTICAL SCIENCES CENTER, UNIV. OF ARIZ., TUCSON ☐ Tucson, Ariz. (S. F. Jacobs, Optical Sciences Center, Univ. of Ariz., Tucson, Ariz. 85721)

9-27 JULY

Modern Engineering Applications of Coherent Optics and Holography □ OAKLAND UNIV. SCHOOL OF ENGINEERING □ Rochester, Mich. (Short Course Director, J. Der Hovanesian, School of Engineering, Oakland Univ., Rochester, Mich. 48063)

16-27 JULY

Contemporary Optical Engineering ☐ INST. OF OPTICS, UNIV. OF ROCHESTER ☐ Rochester, N. Y. (Inst. of Optics, Univ. of Rochester, Rochester, N. Y. 14627)

22 JULY-3 AUGUST

Transition Metals, Alloys and Magnetism □ CANADIAN ASSOC. OF PHYSICISTS, NATO ADVANCED STUDY INST. □ Mont Tremblant, Quebec, Canada (S. H. Vosko, Physics Dept., Univ. of Toronto, Toronto M5S 1A7, Canada)

30 JULY-2 AUGUST

Optical System Design ☐ INST. OF OPTICS, UNIV. OF ROCHESTER ☐ Rochester, N. Y. (Inst. of Optics, Univ. of Rochester, Rochester, N. Y. 14627)

30 JULY-7 AUGUST

Energy Sources for the Future □ OAK RIDGE ASSOCIATED UNIVERSITIES □ Oak Ridge, Tenn. (L. K. Akers, Special Training Division, Oak Ridge Associated Universities, P. O. Box 117, Oak Ridge, Tenn. 37830) [4/16/73]

30 JULY-10 AUGUST

Industrial Applications of Modern Physics □ DEPT. OF PHYSICS AND ASTRONOMY, UNIV. OF WYOMING □ Laramie, Wyoming (C. R. Smith, Dept. of Physics and Astronomy, Univ. of Wyoming, University Station, Box 3905, Laramie, Wyoming 82070)

Topics: Laser and laser-related physics, physics of semiconductor devices, low-temperature quantum optics, information theory and data reduction.

6-24 AUGUST

Trace Analysis for Environmental Pollutants □ OAK RIDGE ASSOCIAT-ED UNIVERSITIES □ Oak Ridge, Tenn. (L. K. Akers, Special Training Division, Oak Ridge Associated Universities, P. O. Box 117, Oak Ridge, Tenn. 37830) [4/16/73]

11 OCTOBER

Vacuum Microbalance Techniques ☐ EDUCATION COMMITTEE OF AVS ☐ New York, N. Y. (A. W. Czanderna, Clarkson College of Technology, Potsdam, N. Y. 13676)

JUNE 1973

CAL CRYSTALLOGRAPHY OF NAS, RESEARCH COUNCIL OF NSF

Hanover, N. H. 12/72

JULY 1973

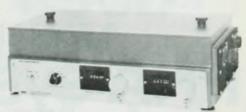
- 2-6 Fuel and Fuel Elements for Fast
 Reactors □ IAEA □ Brussels,
 Belgium (J. H. Kane, Special
 Assistant for Conferences, Office
 of Information Services, US
 Atomic Energy Commission,
 Washington, D. C. 20545)
- I-5 Scanning Electron Microscopy
 Systems and Applications □
 ELECTRON MICROSCOPY AND
 ANALYSIS GROUP OF IOP □
 Newcastle-upon-Tyne, UK 11/72

- 3-6 Molecular Motions in Liquids □ SOCIETY OF PHYSICAL CHEM-ISTRY □ Paris, France 3/72
- 4–10 Quantum Chemistry ☐ INTER-NATIONAL ACADEMY OF QUANTUM MOLECULAR SCI-ENCE ☐ Menton, France 2/73
- 7-14 Science and Society: Scientific,
 Technological and Social Development □ COUNCILS FOR
 SCIENTIFIC AFFAIRS IN YUGOSLAVIA □ Herceg-Novi, Yugoslavia 3/73
- 9-12 Molecular Beams

 ORGANIZING COMMITTEE OF FOURTH
 INTERNATIONAL SYMPOSIUM
 ON MOLECULAR BEAMS
 Cannes, France 4/72

MPI

MODULAR SYSTEMS



MP-1018A Czerny-Turner Monochromator

Ruggedly built on a single aluminum casting, the MP-1018A may be used from 180 nm to 30 microns, depending on choice of grating. Integrated circuits digitally control six switch-selected scanning speeds. Wavelength may also be changed manually. Simple connectors join the MP-1018A Monochromator with other MP-System optical units to insure proper alignment. A full line of accessories is available.

SPECIFICATIONS

Optical-

Effective aperature ratio: f/8. Focal length: 457 mm. Reciprocal linear dispersion at exit slit: 35Å/mm in first order with 590 grooves/mm grating supplied. Grating range: Gratings available for use from 180 nm to 30 microns. Resolution: At least 1Å in first order with 0.01 mm slit width and 1180 grooves/mm grating. At least 5Å in first order with 0.05 mm slit width and 590 grooves/mm grating. Diffraction grating: Plane reflection replica grating, 48 mm x 48 mm. Stray light: 0.1% or less within ± 1½ bandwidths of a given line.

Mechanical-

Wavelength readout: From digital counter, 2A per division with 590 grooves/mm gratings. Wavelength dial linearity: ±1 division (typical) to 8000 and to ±5 divisions (typical) at 15,000. Slits: Straight slits 12.7 mm high, width adjustable in unison from 5 to 5000 microns. Width read from digital counter, 2 microns per division. Height reducible by inserting baffle plugs. Slit construction: Honed, hardened, stainless steel. Cannot be damaged by closing. Scanning speeds: 50, 100, 200, 250, 500 and 1000A/minute (with 590 grooves/mm grating). Speed determined by switch position. Other speeds available. Dimensions: 211/2" L x 11" W x 71/2" H; 35 pounds.

Electrical-

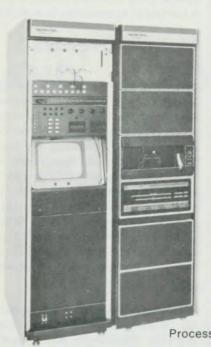
Scan drive: operates on 117 V, 60 Hz; 2.5 watts. Models available for other voltages and 50 Hz. Power cord: Standard three-wire (grounding).

Prices start at \$1165.

McKEE-PEDERSEN INSTRUMENTS Phone 415-937-3630 Box 322, Danville, CA 94526 USA

Circle No. 68 on Reader Service Card PHYSICS TODAY / APRIL 1973

does



The TP-5000 Pulse Height Analysis System with Hybrid Computer Control and Ultrafast Processing Software

· Simultaneous acquisition, display, and analysis provided by HYCCUPS.

· Unlimited software expansion using FOCAL®, a simple yet powerful high level language.

· Bright, flicker-free display with light pen interaction.

 PDP-11 CPU controlled via custom-labelled switch panel.

 Full line of peripherals, including tapes, discs and plotters.

Write or call:

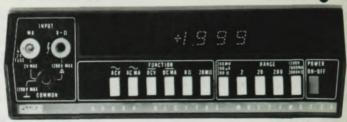
TENNECOMP SYSTEMS INC.

795 Oak Ridge Turnpike
Oak Ridge, Tennessee 37830 Phone (615) 482-3491

®TM of Digital Equipment Corp.

Circle No. 69 on Reader Service Card

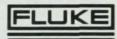




*New

 26 ranges to measure ac/dc voltages from 100 microvolts to 1200 V, ac/dc currents from 100 nanoamperes to 2 amperes and resistance from 100 milliohms to 20 megohms.

 Basic dc accuracy, 0.1%.
 Guaranteed for one full year. Fluke gives you the best specs and strongest warranty on the market today for the lowest cost of ownership ever. • Wide choice of options including rechargeable battery pack, digital printer output, deluxe test leads, high-voltage probe, RF probe, 200-amp ac current probe, carrying case, dust cover and rack mounts. . Unique self-zero feature eliminates offset errors. • Rugged high-impact case with securely mounted internal electronics. . Service centers throughout U.S., Canada, Europe and Far East for 48-hour turnaround repairs.



P.O. Box 7428, Seattle, Washington 98133.

Get all the details from your nearest Fluke sales office. Dial toll-free 800-426-0361 for address of office nearest you.

Circle No. 70 on Reader Service Card

Your load impedances can't upset our 1 kW broadband amplifier

Model 1000L will drive any load impedance

10 KHZ - 220 MHZ

Versatile and reliable -- that's the best way to describe Amplifier Research's Model 1000L. This powerful 1000-watt unit features unique protective circuitry to permit operation into any load impedance without shutdown or damage. And it's simple to operate -- all you need is a standard sweep or signal generator. Convenient front panel controls permit you to select the desired operating mode -- 100 or 1000-watt CW output or 4-kilowatt pulse output. Model 1000L is ideally suited for antenna and component testing, equipment calibration, EMI susceptibility test-



ing, biological research, and a variety of other applications. For complete information, write or call Amplifier Research, P. O. Box 7, New Britain, Pa. 18901. Phone 215-822-0161.



Circle No. 71 on Reader Service Card

JULY 1973

- 10-13 Gasdynamics of Explosions and Reactive Systems □ INTERNA-TIONAL ACADEMY OF ASTRO-NAUTICS □ La Jolla, Calif. 9/72
- 16-18 Fluid and Plasma Dynamics ☐ AIAA ☐ Palm Springs, Calif. 2/73
- 16-18 Thermophysics ☐ AIAA ☐ Palm Springs, Calif. 2/73
- 16-19 Shock Tubes ☐ NINTH INTER-NATIONAL SHOCK TUBE SYM-POSIUM ☐ Stanford, Calif. 11/72
- 16-20 Electronic and Atomic Collisions

 ORGANIZING COMMITTEE
 FOR THE 8TH INTERNATIONAL
 CONFERENCE ON THE PHYSICS OF ELECTRONIC AND
 ATOMIC COLLISIONS
 Belgrade, Yugoslavia (R. Geballe,
 Conference Secretary, Physics
 Dept., Univ. of Washington, Seattle, Wash. 98195)
- 18-20 Acoustical Holography and Imaging □ IEEE, ASA, STANFORD RESEARCH INST. □ Menlo Park, Calif. 2/73
- 23-26 Impact Ionization ☐ EPS ☐ London, UK 10/72
- 23-26 Nuclear and Space Radiation Effects □ IEEE, UTAH STATE UNIVERSITY □ Logan, Utah (J. S. Nichols, AFWL/ELT, Kirtland AFB, New Mexico 87117) [3/30/73]
- 30-2 ◆ ☐ ANNUAL MEETING OF AAPM
 ☐ San Diego, Calif. 12/72 (Note corrected date.)
- 30-5 Controlled Thermonuclear Fusion and Plasma Physics □ EPS; I. V. KURCHATOV INST. FOR ATOMIC ENERGY; USSR ACADEMY OF SCIENCES; M. V. LOMONOSOV INST., MOSCOW STATE UNIV. □ Moscow, USSR 2/73

AUGUST 1973

- 6-8 Thermophysical Properties
 AMERICAN SOCIETY OF ME-CHANICAL ENGINEERS
 Atlanta, Ga. 10/72
- 7-9 Positron Annihilation

 HELSINKI UNIV. OF TECH.
 Otaniemi, Finland (R. Nieminen, Positron Conference, Dept. of Technical Physics, Helsinki Univ. of Tech., SF-02150 Otaniemi, Finland)
- 3-10 Cryogenic Engineering □ NBS □ Atlanta, Ga. 2/73
- Formation and Dynamics of Galaxies ☐ INTERNATIONAL ASTRONOMICAL UNION ☐ Canberra, Australia 3/72

- 13-15 ♦ Stellar Instability and Evolution ☐ INTERNATIONAL ASTRONOMI-CAL UNION ☐ Canberra, Australia 3/72 (Note corrected date.)
- 13-17 ☐ APS DIVISION OF PARTI-CLES AND FIELDS ☐ Berkeley, Calif. 2/73
- 13–17 Metal Surfaces ☐ CHALMERS UNIV. OF TECH. ☐ Goteborg, Sweden 2/73
- 13-17 Physics and Chemistry of Fission □ IAEA, AEC □ Rochester, N. Y. (J. H. Kane, Special Assistant for Conferences, Office of Information Services, US Atomic Energy Commission, Washington, D. C. 20545)
- 14-16 Defects and Defect Clusters in Body-Centered-Cubic Metals and their Alloys □ NBS, NUCLEAR METALLURGY COMMITTEE OF THE AMERICAN INST. OF METALLURGICAL ENGINEERS, NSF □ Gaithersburg, Md. 3/73
- 14-16 Microwave Semiconductor Devices ☐ CORNELL UNIVERSITY ☐ Ithaca, N. Y. 1/73
- 14-16 New Problems of Astrometry ☐ INTERNATIONAL ASTRONOMI-CAL UNION ☐ Perth, Australia 3/72
- 15-17 High Polymers ☐ MACROMO-LECULAR SCIENCES DIVISION OF THE CHEMICAL INST. OF CANADA, NATIONAL RE-SEARCH COUNCIL ☐ St Jean, Quebec (E. G. Lovering, High-Polymer Forum, Pharmaceutical Chemistry Division, Health Protection Branch, Tunney's Pasture, Ottawa, Ontario K1A L02, Canada) [4/30/73]
- 17-30 ◆ Cosmic Rays □ IUPAP □ Denver, Colo. 5/72 (Note corrected date.)
- 20-24 Order in Polymer Solutions ☐ MIDLAND MACROMOLECULAR INST. ☐ Midland, Mich. 2/73
- 22-24 Applications of X-Ray Analysis ☐ METALLURGY AND MATERIALS SCIENCE DIVISION, DENVER RESEARCH INST.. UNIV. OF DENVER ☐ Denver, Colo. (Metallurgy and Materials Science Division, Denver Research Inst., Univ. of Denver, Denver, Colo. 80210) [4/16/73]
- 22-28 ◆ Magnetism □ IUPAP, ACADEMY
 OF SCIENCES OF THE USSR □
 Moscow, USSR (A. A. Goussev,
 Secretary of the Organizing
 Committee, 1973 International
 Conference on Magnetism, 44
 Vavilova St, Bldg. 2, Rm 44,
 Moscow 117333, USSR)
 [6/1/73] (Note corrected date.)
- 23, 24 High-Energy Collisions

High Resolution Diffraction Gratings for Astronomy and Basic Physics



These diffraction gratings are replicated from master rulings produced on Dean G. R. Harrison's "C" ruling engine housed at MIT. The "C" engine has for some months been producing the world's highest resolution gratings* and PTR has succeeded in producing replicas that match the performance of the original. The high order efficiency is typically 60% with negligible ghost intensities and scattered light. The wavefront shown is representative of the current state-of-the-art.

*G. R. Harrison, et al., JOSA. Vol. 62, No.6, pp. 751-756.

Existing and Planned PTR Rulings

Ruling No.	Maximum Ruled Area 7" x 14"	Line Spacing/ Blaze Angle	
		632/mm/	51°
C-061	7" x 14"	632/mm/unblazed	
C-070	6" x 12"	31.6/mm/	63°
Planned	7" x 14"	632/mm/	58°
Planned	10" x 20"	316/mm/	63°
Planned	10" x 12"	632/mm/	25°

Prices are very competitive. Deliveries are typically 60 days for replicas from existing masters.





Photoconductivity Measurement . . .



Flash Photolysis



2 MHz ESR Detection System for Flash Photolysis and Radiolysis





Model 410 NMR Heteronuclear Decoupler

NEW! NMR GAUSSMETER Model 515

Microwave ▲ Instrumentation for Science and Industry stabilizers mm-wave sweepers sources/mixers/multipliers INSTRUMENT CO., INC. 6104 North Pulaski Rd., Chicago, Illinois 60646

Circle No. 73 on Reader Service Card

AUGUST 1973

ORGANIZING COMMITTEE FOR THE FIFTH INTERNATIONAL CONFERENCE ON HIGH-ENER-GY COLLISIONS | State Univ. of N. Y. at Stony Brook 3/73

- 27-1 Nuclear Physics | IUPAP, EPS I Munich, Germany 2/73
- 27-29 Preparation and Properties of Electronic Materials □ ELECTRONIC MATERIALS COMMIT-TEE OF THE AMERICAN INST. OF MINING, METALLURGICAL AND PETROLEUM ENGINEERS □ Las Vegas, Nevada [4/15/73]
- Nuclear Magnetic Resonance in 28 - 1Solids | POLISH INST. of NU-CLEAR PHYSICS, AMPERE GROUP Cracow, Poland 2/73
- 29-31 ☐ FIFTH INTERNATIONAL CON-FERENCE ON SOLID STATE DE-VICES ☐ Tokyo, Japan 12/72
- 29-1 Rare Earth Metals

 DANISH ATOMIC ENERGY COMMIS-SION, EPS

 Elsinore, Denmark

SEPTEMBER 1973

- Chemical Thermodynamics AUSTRIAN CHEMICO-PHYSI-CAL SOCIETY D Baden, Austria
- ♦ Galactic Radio Astronomy □ IN-3-7 TERNATIONAL ASTRONOMICAL UNION D Maroochydore, Australia 3/72 (Note corrected location.)
- 3-7 Fine Structure of the Chromosphere | INTERNATIONAL AS-TRONOMICAL UNION ☐ Surfers' Paradise, Australia 3/72
- ♦ Exploration of the Planetary System | INTERNATIONAL ASTRO-NOMICAL UNION | Torun, Poland 3/72 (Note corrected date.)
- 5-8 Gravitational Radiation and Gravitational Collapse | INTERNA-TIONAL ASTRONOMICAL UNION ☐ Warsaw, Poland 3/72
- 5-8 · Magnetic Structures in Superconductors

 ARGONNE NA-TIONAL LABORATORY. DIVISION OF SOLID-STATE PHYSICS, COMMISSION A1 OF THE INTERNATIONAL INST. OF REFRIGERATION, IUPAP [Argonne, III. (R. P. Jeubener, Solid-State Science Division, Argonne National Laboratory, Argonne, III. 60439) [6/1/73]
- 5-8 Stability of the Solar System and of Smaller Stellar Systems | IN-TERNATIONAL ASTRONOMICAL UNION ☐ Warsaw, Poland 3/72
- 6-12 Elementary Particles □ OR-

20% Unemployment **Predicted for** Ph.D. Physicists

This surplus of Ph.D. physicists means the following for you:

- 1. Lower salaries.
- Longer working hours.
 Shorter careers; Unemployment in middle ages.
- 4. Slower promotions.
- 5. Job insecurity.

The American Physicists Associa-tion's 1973 "Projected Supply and Demand for Physicists" manpower report indicates that during the decade of the '70's the supply of physicists will far outstrip the de-

While the supply lasts non-members may buy this special 60 page report for \$5.00. Please send your check and order to APA today so that you can be assured of getting your copy of this very valuable study.

APA is trying to balance the supply of and the demand for physicists, and is vigorously working for the improve-ment of physicists' salaries and job

Physicists are no longer held in high esteem by Washington, as shown by the abolishment of the Office of Science and Technology. Research funds have been cut and frozen. Washington sees physicists as a bunch of wild-eyed, frizzy long-haired eggheads with no political punch.

APA can do something about this. APA knows how to work constructively to accomplish deeds-not showy demonstrations that often do more damage to our interests than good. We offer no simple or radical solution to the economic problems facing physicists. We do offer a chance for physicists to work to-gether for the improved scientific health of our nation and for the economic benefit of all physicists.

We need your support. You should join APA today. If you don't join us we will fail. If we fail it will cost you money, prestige, and security. Dues are:

> \$5.00—for physics graduate students' 1 year trial membership, with no voting privileges, right to hold office, or Personnel Serv-

\$10.00-if employed 1/2 time or less.

\$20.00—otherwise.

By joining APA now you will receive, while the supply lasts, a free copy of APA's manpower study.

American Physicists Association, Box 19343 Washington, D. C. 20036

BIC **Current Integrators** Since 1964



Model 1000-C*

- Highest accuracy
- Widest current span
- Lowest input impedance
- Internal offset & test supply
- Solid state (LED) readout
- Automatic dead-time correction
- Inputs of either polarity
- · Ground isolated from case
- Remote control capability
- · Pulse integration without external filters

Complete specs on request BROOKHAVEN INSTRUMENTS CORP. Box 3136 . Austin, Texas 78764 (512) 442-1216

*Also available without internal counter as Model 1000-A

Circle No. 75 on Reader Service Card

CRYOMECH CM SERIES **CRYO** REFRIGERATORS CM SERIES

CRYOMECH'S Series CM closed cycle Cryo Refrigerators can eliminate 70-90% Working with superconduct ing magnets can cost the average user \$5,000-\$20,000 per year in liquid helium losses... now with CRYOMECH'S CM Series you can realize the savings within 18 months and have your CRYOMECH Cryo Refrigerator paid for with the savings.

You'll easily attain 1.8°K to 150°K with the flick of a switch!

FEATURES

TYPICAL APPLICATIONS
 Superconducting magnets NMR systems

TYPICAL PAYBACK 6-18 MONTHS



PHONE 315-475-9692

314 AINSLEY DR. SYRACUSE, N. Y. 13210. USA

GANIZING COMMITTEE FOR THE 2ND AIX-EN-PROVENCE INTERNATIONAL CONFERENCE ON ELEMENTARY PARTICLES ☐ Aix-en-Provence, France (M. S. Detoeuf, L N2 P3, 11 rue Pierre et Marie Curie, 75005 Paris, France)

- 7-11 Coronal Disturbances □ INTER-NATIONAL ASTRONOMICAL UNION D Surfers' Paradise, Australia 3/72
- Solid-State Devices □ IOP □ 10.11 Univ. of Nottingham, UK 2/73
- 10-12 Confrontation of Cosmological Theories with Observational Data INTERNATIONAL ASTRO-NOMICAL UNION | Cracow, Poland 3/72
- 10-12 Late Stages of Stellar Evolution INTERNATIONAL ASTRO-NOMICAL UNION D Warsaw, Poland 3/72
- 10-14 Mass Spectrometry □ 6TH IN-TERNATIONAL MASS SPEC-TROMETRY CONFERENCE [Edinburgh, UK 1/73
- 10-14 Phenomena in Ionized Gases ORGANIZING COMMITTEE OF 11TH INTERNATIONAL CON-FERENCE ON PHENOMENA IN IONIZED GASES | Prague, Czechoslovakia 8/72
- 10-14 ♦ Radioimmunoassay and Related Procedures

 IAEA Istanbul, Turkey 12/72 (Note new date)
- 12-14 Physics of Semimetals and Nar-Semiconductors row-Gap UNIV. OF WALES INSTITUTE OF SCIENCE AND TECHNOLOGY. UNIV. COLLEGE OF CARDIFF. SOLID-STATE PHYSICS SUB-COMMITTEE OF IOP Cardiff, UK 7/72
- Silicon Carbide

 AIR FORCE 16-20 CAMBRIDGE RESEARCH LAB-ORATORIES, UNIV. OF SOUTH CARBORUNDUM CAROLINA. CO, GENERAL ELECTRIC CO, HUGHES RESEARCH LABORA-TORIES. WESTINGHOUSE ELECTRIC CORP. INTERNA-TIONAL COMMITTEE ON SILI-CON CARBIDE I Miami Beach, Fla. 2/73
- 16-22 Spectroscopy ☐ ORGANIZING COMMITTEE FOR THE 17TH INTERNATIONAL SPECTRO-SCOPIC COLLOQUIUM | Florence, Italy (AIM-17th CSI, Piazzale R. Morandi 2, 20121 Milan, Italy)
- COMBUSTION INST. EURO-PEAN SYMPOSIUM | Univ. of Sheffield, UK 2/73
- 18-21 ♦ Solid-State Devices D EPS. GERMAN PHYSICAL SOCIETY, IEEE. NACHRICHTENTECH-

Temperature Controller



Model 5301-E

With an input circuitry designed to accept resistance or voltage generating temperature sensors such as GaS-diodes, thermocouples, Ge & Pt Sensors, Carbon Resistors and Thermistors. The 5301-E, three mode controller offers temperature regulation to better than 0.01°K (or °C) in Vacuum chambers, Cryogenic dewars, Optical ovens, Tensile strength test apparatus, etc. for physics, metallurgy, chemistry and other scientific fields where the control and temperature range requirements are broad or change frequently. Set point readout is either directly in mV or Ohms (4-terminal measurement), with unlimited temperature range. Proportional, rate and reset modes are all internally adjustable, allowing to tune the controller to the thermal time constants of the process. 100 Watts, DC output or up to 5KW with Model 2202.

artronix

INSTRUMENTATION

716 Hanley Industrial Court, St. Louis, Mo. 63144 Phone 644-2456 Area Code 314

POWER MODULE



Model 2202

To regulate an AC-line connected load by means of a small DC signal from an auto-matic control instrument. It supplies large amounts of power for control of resistive heaters, thermo-electric elements, light sources, etc. in temperature controlled ovens, vacuum deposition equipment, infared heat sources, temperature baths and other applications. The instrument features a pulse-width-modulated zero crossing fires TRIAC circuit to minimize RF Interference, electronic protection against current overloads and voltage transient, and provides linear control to a AC power line up to 25 Amp. (110 V or 220 V).



INSTRUMENTATION

716 Hanley Industrial Court, St. Louis, Mo. 63144 Phone 644-2456 Area Code

HIGH VOLTAGE

dc power supply



\$100-2C: 100 kV, 2 mA

Regulation < 0.05% • Ripple < 0.1%

Polarity Reversible • Ten turn voltage control • Zero start and customer interlocks

• Short circuit and overload protection
• 4½" panel meters • Controls 19" x
5½" x 7" • HV unit 26" x 15" x 18"
• 10' HV cable • 25' control cable • and
Plenty more for \$2,850 U.S.A. and Canada.
Other models 50 kV to 1.5 MV in 1973



catalog

DELTARAY CORPORATION

10 HENSHAW STREET, WOBURN, MASSACHUSETTS 01801 (617) 935-3114

Circle No. 78 on Reader Service Card

Neutral Density Filters

Made of best grade optical glass "dyed" en masse



Available in 2" x 2" size, in densities of 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 2.0 and 3.0. Custom made instrument box holding 12 filters \$300.00 per set.

For certain usages the Absorption Type Filters are preferred to the metallic and dielectric types. Colors are stable. May be stacked together for certain densities. Optical densities are held to exceptionally close tolerances of plus or minus 0.050mm in thickness with densities varying in 0.1 to 0.4 inclusive plus or minus 0.005%; in 0.6 to 1.0 inclusive plus or minus 0.002%; and 2.0 to 5.0 inclusive plus or minus 0.008%.

OPTICS FOR INDUSTRY

ROLYN OPTICS

300 North Rolyn Place P.O. Box 148 • Arcadia, Calif. 91006 Circle No. 79 on Reader Service Card

SEPTEMBER 1973

NISCHE GESELLSCHAFT IM VDE (NTG) D Munich, Germany (E. Preuss, Secretary ESSDERC 1973, Siemens AG, Forschungslaboratorium, D-8000 München 80, Balanstr. 73, Germany) [5/14/73] (Note new information)

- 19-21 Polymers □ POLYMER PHYSICS GROUP OF IOP □ Shrivenham, UK 12/72
- 20, 21 Properties of Building Materials

 ☐ MATERIALS AND TESTING
 GROUP OF IOP ☐ Cambridge,
 UK 1/73
- 23–26 Optical Properties of Thin Films

 ☐ OPTICAL GROUP OF IOP ☐

 Southampton, UK 1/73
- 24-28 Atomic Collisions in Solids ☐ ORNL ☐ Gatlinburg, Tenn. (S. Datz, ORNL, P. O. Box X, Oak Ridge, Tenn. 37830) 3/73
- 24-28 Noble Gases ☐ US ENVIRON-MENTAL PROTECTION AGEN-CY, UNIV. OF NEVADA ☐ Las Vegas, Nev. 10/72
- 26-28 Quantum Theory □ DEPT. OF THEORETICAL CHEMISTRY, UNIV. OF OXFORD, UK □ Oxford, UK (C. A. Coulson, Dept. of Theoretical Chemistry, 1 South Parks Road, Oxford OX1 3TG, UK) 3/73

OCTOBER 1973

- 1–3 Exoelectrons ☐ CZECHOSLO-VAK ACADEMY OF SCIENCES ☐ Prague, Czechoslovakia 2/73
- 8-15 Space Activity: Impact on Science and Technology □ INTER-NATIONAL ASTRONAUTICAL FEDERATION □ Baku, USSR 2/73
- 9-12 □ AVS □ New York, N. Y. (R. B. Marcus, Program Chairman, Bell Telephone Labs, Murray Hill, N. J. 07974)
- 9-12 □ OSA □ Rochester, N. Y.

 (Optical Society of America,
 2100 Pennsylvania Ave, NW

 Washington, D. C. 20037)
- Vacuum Microbalance Techniques □ AVS □ New York,
 N. Y. (A. W. Czanderna, Clarkson College of Technology, Potsdam, N. Y. 13676) [6/8/73]
- 30-4 ☐ APS PLASMA PHYSICS DIVI-SION ☐ Philadelphia, Pa. 2/73

NOVEMBER 1973

- 1-3 ☐ APS NUCLEAR PHYSICS DI-VISION ☐ Bloomington, Ind. 2/73
- 5-7 ♦ Thermal Conductivity □ OR-

LOW TEMPERATURE GERMANIUM BOLOMETERS

Guaranteed N.E.P. As low as 1 x 10⁻¹⁴ Watt/Hz^{1/2} \$1,000 to \$3,000

LIQUID HELIUM DEWARS

- Model HD-2—vapor cooled radiation shield, capacity 1.2 liters, guaranteed hold time 24 hours at 4.2°K.
- Model HD-3—liquid nitrogen cooled radiation shield, capacity 1.1 liters, guaranteed hold time 150 hours at 4.2°K.

\$1,495

Infrared Laboratories, Inc.

P.O. Box 17015 Tucson, Arizona 85710 (602) 325-6491

Circle No. 80 on Reader Service Card

ANNOUNCING NEW COMPUTERIZED BIBLIOGRAPHIC SERVICE

Are you keeping in touch month-to-month with happenings in your field?

The New York University Computer Assisted Information Service-NYUCAIS-is prepared to offer a "current awareness service" using the AIP information system. This system classifies and abstracts articles appearing in the world's 70 most important physics journals. NYUCAIS provides monthly references and abstracts of only those articles which match the individualized profile prepared by the subscriber. Searches using Boolean combinations of descriptors, which are very difficult and time consuming to do manually, are implemented in this system. The cost of the service is \$250 per profile per year. For additional information, write to: NYUCAIS, New York University, 635 East Building, Washington Square, New York, N.Y. 10003

Circle No. 81 on Reader Service Card

FLUID DYNAMICIST

We are looking for a Ph.D. Engineer or Physicist well-versed in theoretical fluid dynamics accenting the behavior of compressible, elastic, and plastic materials to develop and maintain user-oriented large computer programs involving Eulerian hydrodynamics with realistic numerical models of actual materials. The programs will be used in weapons-related calculations.

The University of California's Los Alamos Scientific Laboratory offers excellent working conditions and fringe benefits, including 24 days annual vacation, ample sick leave, and progressive retirement plan. Located high in the mountains of Northern New Mexico, the climate is superb—cool summers and mild winters. Recreational opportunities abound.

Send complete resume to: R. Lynn Wilson, Recruiting Supervisor



Division 73-E

Los Alamos Scientific Laboratory P.O. Box 1663 Los Alamos, New Mexico 87544

U.S. CITIZENSHIP REQUIRED
AN EQUAL OPPORTUNITY EMPLOYER

UNIVERSITY OF LIVERPOOL

Chair of Theoretical Physics

Applications are invited for the Chair of Theoretical Physics in the Department of Applied Mathematics and Theoretical Physics which will become vacant on 30th September, 1973.

The salary will be within the range currently approved for full-time professorial appointments and in any case not less than £5,667 per annum.

Applications (12 copies), together with the names of three referees, should be received not later than 25th April, 1973, by the undersigned, from whom further particulars may be obtained. (Candidates overseas may send one copy only, by airmail.) Quote ref. RV/PT/14215

The University, P.O. Box 147. Liverpool. L69 3BX.

> H.H. Burchnall, Registrar.

GANIZING COMMITTEE FOR THE 13TH INTERNATIONAL CONFERENCE ON THERMAL CONDUCTIVITY | Lake of the Ozarks, Mo. (L. Reisbig, Dept. of Mechanical Engineering, Univ. of Missouri, Rolla, Mo.) (Note new information)

- 12, 13 LAMPF Users Group Meeting □
 LAMPF USERS GROUP, INC □
 Los Alamos, New Mexico (L.
 Agnew, LAMPF Users Group,
 Inc. P. O. Box 1663, Los Alamos, New Mexico 87544)
- 13-16 ♦ Magnetism ☐ AIP; MAGNETICS SOCIETY OF IEEE; ONR; AMERICAN INST. OF MINING, METALLURGICAL AND PETROLEUM ENGINEERS; ASTM ☐ Boston, Mass. [7/20/73] 2/73 (Note new information.)

DECEMBER 1973

- 10-14 Science of Materials □ IOP □ Christchurch, New Zealand 1/73
- 27-29

 APS Berkeley, Calif. (W. Whaling, Calif. Inst. of Tech., 1201 E. California St, Pasadena, Calif. 91109) [10/12/73]

FEBRUARY 1974

11-13 • Vacuum Conference

TRALIAN INST. OF PHYSICS
Canberra, A. C. T. Australia
(R. J. MacDonald, Physics
Dept., Australian National Univ.,
P. O. Box 4, Canberra, A. C. T.
Australia 2601)

MAY 1974

2-7 • High-Energy Accelerators
IUPAP, AEC
Stanford, Calif.

(R. B. Neal, 9th International Conference on High-Energy Accelerators, Stanford Linear Accelerator Center, P. O. Box 4349, Stanford, Calif. 94305)

JULY 1974

23-31 Acoustics BRITISH ACOUSTI-CAL SOCIETY, IOP, INTERNA-TIONAL COMMISSION ON ACOUSTICS London, UK 1/73

AUGUST 1974

19–23 ☐ ACA ☐ Pennsylvania State University 1/73

SEPTEMBER 1974

18, 19 Electrical Properties of Polymers

☐ POLYMER PHYSICS GROUP
OF IOP ☐ Cardiff, UK 12/72

APRIL 1975

9-11 Temperature Measurement
MATERIALS TESTING GROUP
OF IOP, INSTITUTE OF MEASUREMENT AND CONTROL, INSTITUTION OF ELECTRICAL ENGINEERS
Teddington, UK
1/73

CRYOGENIC Temperature Controller



Model 5301

Accurate temperature control in Research Dewars, Cryogenic Freezers, Tensile Cryostats for physics, chemistry, metallurgy and other scientific fields where the process, temperature and/or control requirements change frequently. System features control stability better than .01°K from below 0.3° to 320°K with less than one microwatt power dissipation in the sensor. Three mode control: Proportional, rate and reset with internal parameter controls, allowing to tune the controller to thermal characteristics of the system. 100 watts output, short circuit proof, DC for minimum interference to other low level instrumentation.

artronix

INSTRUMENTATION

716 Hanley Industrial Court, St. Louis, Mo. 63144 Area Code 314 Phone 644-2456

PROGRAMMER



Model 5350

The Model 5350 Programmer is an electromechanical function generator, consisting of a digitally controlled servo-system driving a 10 turn potentiometer at a wide range of sweep rates. The Programmer finds application in the process control field with other instrumentation, whose output is controlled by a resistance or resistance ratio, such as powersupplies, magnetic generators, audio or RF oscillators as well as temperature, deposition-rate, vacuum and similar controllers.



INSTRUMENTATION

716 Hanley Industrial Court, St. Louis, Mo. 63144 Area Code Phone 644–2456

Circle No. 82 on Reader Service Card